

WHAT IS CLAIMED IS:

1. A wireless communications system for allocating network access according to priorities designated for requested transactions of wireless communications, comprising:

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- (a) a wireless network having a plurality of access links for transmitting transactions;
- (b) a plurality of wireless communications devices for requesting transmission of transactions on the wireless network, wherein a designated priority level is associated with each transaction; and
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- (c) an access control manager for scheduling transmission of transactions, when all of the plurality of access links are occupied, by:
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- i) identifying a transaction that is being transmitted over the wireless network and is of lower priority than a requested transaction;
- ii) discontinuing the transmission of the transaction of lower priority; and
- iii) authorizing the transmission of the requested transaction.

2. The wireless communications system according to claim 1, further comprising a data buffer in at least one of the wireless communications devices for

20 storing transaction data,

wherein transaction data is removed from the data buffer as the data is transmitted, such that data that is not transmitted prior to discontinuation of a transaction remains in the data buffer.

5 3. The wireless communications system according to claim 2, wherein a wireless communications device requests transmission of a discontinued transaction until the transaction data remaining in the data buffer is transmitted.

10 4. The wireless communications system according to claim 2, further comprising a plurality of user applications operating on a wireless communications device for generating transactions, at least one user application generating a transaction of a higher priority than a transaction generated by another user application,

15 wherein the wireless communications device requests transmission of the higher priority transaction before requesting transmission of the lower priority transaction.

20 5. The wireless communications system according to claim 4, wherein data from the higher priority transaction is removed from the data buffer before data from the lower priority transaction.

6. The wireless communications system according to claim 4, wherein transactions of different priorities are generated by a user application in the wireless communications device, and the wireless communications device requests transmission of the transactions according to priority when data from transactions of different priorities remains in the data buffer.

7. The wireless communications system according to claim 4, wherein each of the plurality of user applications generates transactions according to a default priority level.

8. The wireless communications system according to claim 4, wherein at least one of the plurality of user applications generates transactions according to a priority level selected by a user from a plurality of priority levels, and wherein one of the plurality of priority levels is a default priority level.

9. The wireless communications system according to claim 1, further comprising a communications manager in at least one of the wireless communications devices for generating a control message for transmission to the access control manager to request transmission of a transaction,

wherein the control message includes an identification code for the wireless communications device and the priority associated with the requested transaction.

10. The wireless communications system according to claim 9, wherein the wireless network is a packet-switched network, and a transaction is composed of a plurality of packets transmitted and received by the wireless communications devices, and a control message is transmitted as at least one packet.

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223 ~ 11. The wireless communications system according to claim 1, further comprising an access buffer in communication with the access control manager for storing transaction data to be transmitted over the wireless network to at least one of the wireless communications devices, and for storing priority information for the transaction data stored in the buffer,

wherein transaction data is removed from the access buffer as the data is transmitted to the wireless communications devices, such that data that is not transmitted prior to a discontinuation of a transaction remains in the access buffer.

15 } 12. The wireless communications system according to claim 10, wherein transaction data from higher priority transactions is removed from the access buffer before data from lower priority transactions.

20 13. The wireless communications system according to claim 1, wherein the priorities are associated with control mechanisms in other networks linked to the wireless network for a communication, for allocating priority end-to-end for each segment of the communication.

14. A wireless communications device for use in a wireless communications system, comprising:

(a) at least one user application operating on the wireless communications device, the user application configured to send data to a wireless network or receive data from a wireless network as part of a transaction;

(b) a data buffer for storing transaction data to be sent by the user application before transmission along the wireless network; and

(c) a communications manager in the wireless communications device for generating a control message to be transmitted to the wireless network to request transmission of a transaction, the control message including an identification code for the wireless communications device and a priority level associated with the transaction.

15. The wireless communications device according to claim 14, wherein the priority associated with the transaction is one of multiple levels of priority, and the wireless network authorizes or denies transmission of the transaction from the user application according to the priority level associated with the transaction.

16. The wireless communications device according to claim 14, further including at least one input interface for a user to select a level of priority from one of several levels of priority.

17. The wireless communications device according to claim 14, further comprising a user interface for indicating whether there is congestion affecting transmission of transactions on the wireless network.

5 ✓ 18. The wireless communications device according to claim 15, wherein the data buffer stores transaction data from multiple transactions, and the communications manager requests transmission of the transaction having the highest priority level.

10 } 19. The wireless communications device according to claim 15, wherein the wireless communications device discontinues the transmission of a transaction in response to a signal from the wireless network.

15 4~ 20. The wireless communications device according to claim 14, wherein the transmission of a first transaction is discontinued when the wireless network is at full capacity and the wireless network receives a request for a second transaction having higher priority.

6 21. The wireless communications device according to claim 20, wherein
20 data that is part of the first transaction is removed from the data buffer as the data is being transmitted, and data that is not transmitted prior to discontinuation of the first transaction remains in the data buffer.

3 ~ 22. The wireless communications device according to claim 21, wherein the communications manager requests transmission of a discontinued transaction until the data remaining in the data buffer is transmitted.

5 0 ? 23. The wireless communications device according to claim 19, wherein the communications manager requests transmission of a discontinued transaction after receiving a signal from the wireless network that there is capacity for a transaction having a lower or same priority as the discontinued transaction.

10 8 ~ 24. The wireless communications device according to claim 14, wherein the user application generates transactions according to a priority level selected by a user from a plurality of priority levels, and wherein one of the plurality of priority levels is a default priority level.

15 10 ~ 25. The wireless communications device according to claim 14, wherein the wireless communications system is on a packet-switched wireless network, and a transaction is composed of a plurality of packets transmitted and received by the wireless communications device, and a control message is transmitted as at least one packet.

26. A method for allocating access to a wireless network according to priorities designated for requested transactions of wireless communications, comprising the steps of:

(a) receiving a request for transmission of a transaction on the wireless network, the request including a designated priority level associated with the transaction;

(b) evaluating network capacity of the wireless network by determining whether there is an available access link;

(c) authorizing a transmission if the requested transaction is of higher priority than another transaction that is being transmitted when there is no available access link in the wireless network; and

(d) discontinuing the transmission of the transaction of lower priority.

27. The method for allocating access according to claim 26, further comprising the steps of:

transmitting an authorization message to authorize transmission of the requested transaction of higher priority; and

transmitting a termination message to discontinue transmission of the transaction of lower priority.

28. The method for allocating access according to claim 27, wherein the transmission request is communicated by either a wireless communications device, which generates transactions, or an access buffer, which receives transaction data to be transmitted to the wireless communications device.

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29. The method for allocating access according to claim 28, wherein the wireless network is a packet-switched network, and

a transaction is composed of a plurality of packets transmitted and received by the wireless communications device, and

10 a transmission request is composed of at least one packet that includes an identification code, if the transmission request is transmitted by the wireless communications device, and a priority level associated with the requested transaction.

30. A method for transmitting a transaction generated in a wireless communications device over a wireless network, comprising the steps of:

(a) designating a priority selected from one or more priority levels for the transmission of the transaction;

(b) generating a transmission request in the wireless communications device, the request including an identification code for the wireless communications device and the priority level for transmission of the transaction;

(c) placing transaction data to be transmitted over the wireless network into a data buffer in the wireless communications device; and

(d) transmitting the transmission request to an access control manager in the wireless network to request authorization for transmission of the requested transaction.

31. The method for transmitting a transaction of claim 30, further comprising the steps of:

(e) receiving an authorization message to transmit transaction data over the wireless network; and

(f) transmitting transaction data from the data buffer corresponding to the authorized transaction until the wireless communications device either completes the transmission of the transaction or receives a notification from the wireless network to discontinue transmission.

32. The method for transmitting a transaction of claim 31, wherein transaction data is removed from the data buffer as the data is transmitted, such that data that is not transmitted prior to discontinuation of a transaction remains in the data buffer.

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33. The method for transmitting a transaction of claim 32, wherein the wireless communications device requests transmission of the discontinued transaction until the transaction data remaining in the data buffer is transmitted.

34. The method for transmitting a transaction of claim 33, wherein the transaction is generated by one of a plurality of user applications operating on the wireless communications device, said user applications generating transactions of different priorities, and wherein the wireless communications device transmits a transmission request for a higher priority transaction before requesting transmission of a lower priority transaction.

35. The method for transmitting a transaction of claim 34, wherein data from the higher priority transaction is removed from the data buffer and transmitted before data from the lower priority transaction.

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36. A method of transmitting a transaction over a wireless network to a wireless communications device, comprising the steps of:

(a) placing transaction data received from a server into an access buffer in the wired network, wherein the transaction data is from a transaction having a designated transmission priority level;

(b) requesting transmission of the transaction data to an access control manager in the wireless network; and

(c) transmitting the transaction data from the access buffer to the wireless communications device when there is either an available access link on the wireless network or another transaction being transmitted at a priority level lower than the designated transmission priority level for the transaction;

wherein the transaction of a lower priority level is discontinued to allow for transmission of a transaction at a higher priority level.

37. The method of transmitting a transaction according to claim 36, wherein data from higher priority transactions are removed from the access buffer and transmitted before data from lower priority transactions.

38. A method of transmitting an e-mail communication from a wireless communications device to an internet e-mail server, comprising the steps of:

(a) designating a transmission priority level for the e-mail communication,
5 selected from one or more priority levels;

(b) placing data from the e-mail communication into a data buffer in the wireless communications device;

(c) transmitting a transmission request to an access control manager in the wireless network to request authorization for transmission of the e-mail
10 communication at the designated transmission priority level;

(d) receiving an authorization message to transmit e-mail communication data over the wireless network;

(e) transmitting e-mail communication data from the data buffer
15 corresponding to the authorized transaction until the wireless communications device either completes the transmission of the transaction or receives a notification from the wireless network to discontinue transmission.

(f) placing e-mail communication data transmitted over the wireless network into temporary memory space in the wireless network; and

(g) sending the e-mail communication on the internet to the e-mail server
20 once all e-mail communication data is placed into the temporary memory space.

39. The method of transmitting an e-mail communication according to claim 38, wherein the designated transmission priority level is user-selected from a group of transmission priority levels.

5 40. The method of transmitting an e-mail communication according to claim 38, further comprising the step of re-transmitting a transmission request to the access control manager to request authorization for transmission of the e-mail communication after receiving a notification to discontinue transmission.

10 41. The method of transmitting an e-mail communication according to claim 40, further comprising the step of re-designating a transmission priority level for the e-mail communication after receiving a notification to discontinue transmission,

15 wherein the re-transmitted transmission request to the access control manager is for transmission at a higher priority level.

42. The method of transmitting an e-mail communication according to claim 38, further comprising the step of receiving a confirmation message when the transmitted e-mail communication is sent on the internet.

43. A method of transmitting data packets of voice communications on a wireless network according to a priority designated for the communication, comprising the steps of:

- (a) receiving a request for transmission of data packets of a voice communication at the designated transmission priority level from a wireless communications device;
- (b) transmitting an authorization message to the wireless communications device to transmit and receive data packets over an access link in the wireless network at a predetermined rate; and
- (c) transmitting data packets at the predetermined rate between the wireless communications device and a voice communications server on the access link, and transmitting data packets from other wireless communications transactions on the access link during periods of time when there are gaps in the transmission of the communication; and
- (d) suspending transmission of the data packets when a request is received for a wireless communication transaction that is at a higher priority level than the voice communication being transmitted.

44. The method of transmitting data packets of voice communications according to claim 43, further comprising the step of sending data packets transmitted from the voice communication device to a voice communications server.

45. The method of transmitting data packets of voice communications according to claim 43, further comprising the step of receiving data packets of a voice communication from a voice communication server for transmission to a voice communication device.

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46. The method of transmitting data packets of voice communications according to claim 43, wherein the designated transmission priority level is user-selected from a group of transmission priority levels.

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